

CLAIMS

1. An audio compression and decompression device,
comprising:

an adaptive differential pulse code modulation circuit
which modulates digital audio data by an adaptive differential
pulse code modulation system; and

a high frequency component cutting unit which cuts off
high frequency components existing on a high frequency band of
the digital audio data before compression which are inputted
to the adaptive differential pulse code modulation circuit.

2. An audio compression and decompression device,
comprising:

an adaptive differential pulse code modulation circuit
which modulates digital audio data by an adaptive differential
pulse code modulation system; and

a high frequency component cutting unit which cuts off
high frequency components existing on a high-frequency band of
the digital audio data after decompressed which are outputted
from the adaptive differential pulse code modulation circuit.

3. The audio compression and decompression device as defined
in Claim 1 or 2 wherein

the high frequency component cutting unit is a low-pass

filter.

4. The audio compression and decompression device as defined in Claim 2 wherein

the high frequency component cutting unit is a noise shaper.

5. The audio compression and decompression device as defined in Claim 1 or 2, further including:

a controller which changes cutoff frequency characteristics of the high frequency component cutting unit according to a compression bit rate of the adaptive differential pulse code modulation circuit.

6. The audio compression and decompression device as defined in Claim 1, further including:

a noise addition circuit which adds noise components which corresponds to high frequency components which have been cut off by the high frequency component cutting unit, to the digital audio data after decompressed which are outputted from the adaptive differential pulse code modulation circuit.

7. The audio compression and decompression device as defined in Claim 6, further including:

a controller which changes cutoff frequency

characteristics of the high frequency component cutting unit, and at least one of the noise components, the frequency band to which the noise components are added, and the volume of the noises, according to a compression bit rate of the adaptive differential pulse code modulation circuit.

8. The audio compression and decompression device as defined in Claim 1 or 2 wherein

the high frequency components cutting unit is a low-pass filter including:

plural first delay circuits which delay input digital audio data;

plural first multipliers which multiply the outputs from the plural first delay circuits by previously set coefficients, respectively;

a first adder which adds the input digital audio data and the outputs from the plural first multipliers;

a second multiplier which multiplies the output from the first adder by a previously set coefficient;

plural second delay circuits which delay output digital audio data;

plural third multipliers which multiply the outputs from the plural second delay circuits by previously set coefficients, respectively;

a second adder which adds the output from the second

multiplier and the outputs from the plural third multipliers;
and

a fourth multiplier which multiplies the output from the second adder by a previously set coefficient.

9. The audio compression and decompression device as defined in Claim 8 wherein:

there is provided a controller which changes cutoff frequency characteristics of the low pass filter according to a compression bit rate of the adaptive differential pulse code modulation circuit, and

said controller changes the respective coefficients of the plural first multipliers and the respective coefficients of the plural third multipliers, for each multiplier.

10. The audio compression and decompression device as defined in Claim 1, further including:

an amplitude detection circuit which detects an amplitude in a high frequency region of the digital audio data before compressed which are inputted to the adaptive differential pulse code modulation circuit; and

a controller which compares the amplitude detected by the amplitude detection circuit with a threshold value, and changes the cutoff frequency characteristics of the high frequency component cutting unit on the basis of the comparison result.

11. The audio compression and decompression device as defined in Claim 10 wherein

the controller changes the cutoff frequency characteristics of the high frequency component cutting unit when the amplitude detected by the amplitude detection circuit exceeds the threshold value.

12. The audio compression and decompression device as defined in Claim 10 wherein

the controller changes the cutoff frequency characteristics of the high frequency component cutting unit when the amplitude detected by the amplitude detection circuit has exceeded the threshold value during a previously set time period, or when amplitude detected by the amplitude detection circuit has not exceeded the threshold value during a previously set time period.